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1 [Platforms: Bluetooth and sensor networks: a reality check](#)



Martin Leopold, Mads Bondo Dydensborg, Philippe Bonnet
November 2003 **Proceedings of the 1st international conference on Embedded networked sensor systems**

Publisher: ACM Press

Full text available: [pdf\(356.11 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The current generation of sensor nodes rely on commodity components. The choice of the radio is particularly important as it impacts not only energy consumption but also software design (e.g., network self-assembly, multihop routing and in-network processing). Bluetooth is one of the most popular commodity radios for wireless devices. As a representative of the frequency hopping spread spectrum radios, it is a natural alternative to broadcast radios in the context of sensor networks. The questio ...

Keywords: bluetooth, mac layer, network self-assembly, sensor nodes

2 [IP lookup and packet classification: Network processor acceleration for a Linux* netfilter firewall](#)



Kristen Accardi, Tony Bock, Frank Hady, Jon Krueger
October 2005 **Proceedings of the 2005 symposium on Architecture for networking and communications systems ANCS '05**

Publisher: ACM Press

Full text available: [pdf\(485.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Network firewalls occupy a central role in computer security, protecting data, compute, and networking resources while still allowing useful packets to flow. Increases in both the work per network packet and packet rate make it increasingly difficult for general-purpose processor based firewalls to maintain line rate. In a bid to address these evolving requirements we have prototyped a hybrid firewall, using a simple firewall running on a network processor to accelerate a Linux* Netfilter Firewa ...

Keywords: hybrid firewall, netfilter, network firewall, network processor, prototype, throughput

3 [Multihop wireless measurements: Cooperative packet scheduling via pipelining in](#)



802.11 wireless networks

Ramana Rao Kompella, Sriram Ramabhadran, Ishwar Ramani, Alex C. Snoeren
 August 2005 **Proceeding of the 2005 ACM SIGCOMM workshop on Experimental approaches to wireless network design and analysis E-WIND '05**

Publisher: ACM Press

Full text available:  [pdf\(218.04 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The proliferation of 802.11a/b/g based wireless devices has fueled their adoption in many domains -- some of which are unforeseen. Yet, these devices lack native support for some of the advanced features (such as service differentiation, etc.) required in specific application domains. A subset of these features relies on cooperative scheduling whereby nodes cooperate among each other to effectively manage resources such as power, throughput and interference in wireless networks. The trajectory of ...


Keywords: 802.11 wireless networks, cooperative scheduling, power conservation, proportional allocation, quality of service, streaming video

4 SCONE: using concurrent objects for low-level operating system programming

Jun-ichiro Itoh, Yasuhiko Yokote, Mario Tokoro

October 1995 **ACM SIGPLAN Notices , Proceedings of the tenth annual conference on Object-oriented programming systems, languages, and applications OOPSLA '95**, Volume 30 Issue 10

Publisher: ACM Press

Full text available:  [pdf\(1.66 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper proposes a methodology for making low-level system code of operating systems be replaceable at runtime. Our approach is to use concurrent objects as a basic programming unit for low-level system programs. To realize the different need for each type of system code and to execute these concurrent objects sufficiently efficient, we use a combination of dedicated system service layers and other implementation techniques. System service layers provide the most suitable primitive operations ...


5 Development of processors and communication networks for embedded systems:

Component-based design approach for multicore SoCs

W. Cesário, A. Baghdadi, L. Gauthier, D. Lyonard, G. Nicolescu, Y. Paviot, S. Yoo, A. A. Jerraya, M. Diaz-Nava

June 2002 **Proceedings of the 39th conference on Design automation**


Publisher: ACM Press

Full text available:  [pdf\(187.62 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents a high-level component-based methodology and design environment for application-specific multicore SoC architectures. Component-based design provides primitives to build complex architectures from basic components. This bottom-up approach allows design-architects to explore efficient custom solutions with best performances. This paper presents a high-level component-based methodology and design environment for application-specific multicore SoC architectures. The system speci ...

Keywords: HW/SW interfaces abstraction, component-based design, multicore System-on-Chip

6 (Special session) presentation and poster session: university LSI design contest: Design and implementation of a video-oriented network-interface-card system

-  Ming-Chih Chen, Shen-Fu Hsiao, Cheng-Hsien Yang
January 2003 **Proceedings of the 2003 conference on Asia South Pacific design automation ASPDAC**

Publisher: ACM Press

Full text available:  [pdf\(279.68 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We design a specific Ethernet network interface card (NIC) for accelerating the video delivery by offloading the overheads of protocol headers identification/append and CRC/checksums calculation, and speeding video bit streams with a dedicated video interface. Compared with the same operations of a 50MHz ARM micro-controller, the NIC system saves 47,000 ns per frame. This NIC card also supports the coexistence of the IPv4 and IPv6 standard for the future extension. Both FPGA prototyping and 0 ...

- 7 [Applications: A high performance Erlang Tcp/Ip stack](#) 

-  Javier Paris, Victor Gulias, Alberto Valderruten
September 2005 **Proceedings of the 2005 ACM SIGPLAN workshop on Erlang ERLANG '05**

Publisher: ACM Press

Full text available:  [pdf\(146.56 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Functional languages are not often associated with the development of network stacks, mainly due to the lower performance and lack of support for system programming than more conventional languages such as C. However, there are functional languages that offer features which make it easier to develop network protocols than using a more conventional approach based on an imperative language. Erlang, for instance, offers support for distribution, concurrency and soft real time built-in into the lang ...


Keywords: TCP/IP, distributed systems, fault tolerance, functional programming


- 8 [upFront](#) 

Linux Journal Staff

July 2004 **Linux Journal**, Volume 2004 Issue 123


Publisher: Specialized Systems Consultants, Inc.

Full text available:  [html\(10.72 KB\)](#) Additional Information: [full citation](#)


- 9 [Full TCP/IP for 8-bit architectures](#) 


-  Adam Dunkels
May 2003 **Proceedings of the 1st international conference on Mobile systems, applications and services MobiSys '03**

Publisher: ACM Press

Full text available:  [pdf\(199.60 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We describe two small and portable TCP/IP implementations fulfilling the subset of RFC1122 requirements needed for full host-to-host interoperability. Our TCP/IP implementations do not sacrifice any of TCP's mechanisms such as urgent data or congestion control. They support IP fragment reassembly and the number of multiple simultaneous connections is limited only by the available RAM. Despite being small and simple, our implementations do not require their peers to have complex, full-size stacks ...

- 10 [Models and metrics of interconnect performance: Investigation of performance metrics for interconnect stack architectures](#) 

-  Puneet Gupta, Andrew B. Kahng, Youngmin Kim, Dennis Sylvester


February 2004 **Proceedings of the 2004 international workshop on System level interconnect prediction**


Publisher: ACM Press

Full text available:  [pdf\(285.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper discusses metrics involving the bandwidth and energy characteristics of arbitrary interconnect stacks. Front-end dimensions are set by lithography and related fabrication restrictions and its performance is easily quantified using well-known metrics such as FO4 or ring oscillator delays, t_{off} , and t_{on} . Back-end dimensions are not similarly constrained yet there are no comparable back-end metrics. In this study we seek figures-of-merit for interconnect architectures (stacks) that descr ...

Keywords: back-end metrics, bandwidth, energy, interconnect stacks, throughput, via blockage

11 Roaming and handoff management: MobileNAT: a new technique for mobility across heterogeneous address spaces 

 Milind Buddhikot, Adiseshu Hari, Kundan Singh, Scott Miller


September 2003 **Proceedings of the 1st ACM international workshop on Wireless mobile applications and services on WLAN hotspots**

Publisher: ACM Press

Full text available:  [pdf\(303.26 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose a new network layer mobility architecture called MobileNAT to efficiently support micro and macro-mobility in and across heterogeneous address spaces common in emerging public networks. The key ideas in this architecture are as follows: (1) Use of two IP addresses -- an invariant virtual IP address for host identification at the application layer and an actual routable address at the network layer that changes due to mobility. Since physical address has routing significance only withi ...


Keywords: MobileNAT, mobility

12 Systems, platforms, and applications: MANTIS: system support for multimodal NeTworks of in-situ sensors 

 H. Abrach, S. Bhatti, J. Carlson, H. Dai, J. Rose, A. Sheth, B. Shucker, J. Deng, R. Han

September 2003 **Proceedings of the 2nd ACM international conference on Wireless sensor networks and applications**


Publisher: ACM Press

Full text available:  [pdf\(424.53 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The *MANTIS* Multimodal system for *NeTworks* of In-situ wireless Sensors provides a new multithreaded embedded operating system integrated with a general-purpose single-board hardware platform to enable flexible and rapid prototyping of wireless sensor networks. The key design goals of MANTIS are ease of use, i.e. a small learning curve that encourages novice programmers to rapidly prototype novel sensor networking applications in software and hardware, as well as flexibility, ...


Keywords: GPS, dynamic reprogramming, lightweight, multimodal prototyping, operating systems, wireless sensor networks

13 Mobile IP 


 Debalina Ghosh

December 2000 **Crossroads**, Volume 7 Issue 2

Publisher: ACM Press

Full text available:  [html\(49.21 KB\)](#) Additional Information: [full citation](#), [index terms](#)

14 Poster Session: Support and optimization of Java RMI over bluetooth environments 

 Pu-Chen Wei, Chung-Hsin Chen, Cheng-Wei Chen, Jenq-Kuen Lee


November 2002 **Proceedings of the 2002 joint ACM-ISCOPE conference on Java Grande**

Publisher: ACM Press

Full text available:  [pdf\(18.49 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we investigate the issues to support Java RMI over Bluetooth environments. Our supports include several technical items. First, we develop a set of protocol stack layers written in Java for Bluetooth support, called *JavaBT*. In *JavaBT*, the HCI layer provides a uniform interface of accessing the Bluetooth hardware capabilities. The L2CAP provides connection-oriented and connection-less data services to upper layer protocols with protocol multiplexing capability, segmen ...

Keywords: Java RMI, bluetooth, graph partitioning, high-performance computing, wireless computing

15 Optimal interconnect buffering: The scaling of interconnect buffer needs 

 Prashant Saxena

March 2006 **Proceedings of the international workshop on System-level interconnect prediction SLIP'06**

Publisher: ACM Press

Full text available:  [pdf\(67.45 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Since wires scale worse than devices, their quadratic delay is often linearized through buffer insertion, leading to a rapid increase in the number of buffers in a design when it is shrunk to successive process nodes. This increase was quantified in an influential work in 2003 by scaling the wiring distribution of a design block and measuring the number of buffers required by it at different process nodes. In this paper, we study the robustness of the data points presented in that work by examin ...


Keywords: buffers, interconnect, repeaters, scaling


16 Features: Storage Systems: Not Just a Bunch of Disks Anymore 

 June 2003 **Queue**, Volume 1 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(1.29 MB\)](#)  [html\(31.84 KB\)](#) Additional Information: [full citation](#), [index terms](#)

17 Architectures: DRM interoperability analysis from the perspective of a layered framework 

 Gregory L. Heileman, Pramod A. Jamkhedkar

November 2005 **Proceedings of the 5th ACM workshop on Digital rights management DRM '05**


Publisher: ACM Press

Full text available:  [pdf\(295.51 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Interoperability is currently seen as one of the most significant problems facing the digital

rights management (DRM) industry. In this paper we consider the problem of interoperability among DRM systems from the perspective of a layered architectural framework. The advantage of looking at the problem from this point of view is that the layered framework provides a certain amount of structure that is very helpful in guiding those working on DRM interoperability issues. Specifically, the layered ...

Keywords: DRM, interoperability, layered architecture

18 Design, implementation, and performance measurement of a native-mode ATM transport layer (extended version) 

R. Ahuja, S. Keshav, H. Saran

August 1996 **IEEE/ACM Transactions on Networking (TON)**, Volume 4 Issue 4

Publisher: IEEE Press

Full text available:  pdf(1.66 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: AAL 5, asynchronous transfer mode, native-mode ATM, personal computer, transport layer

19 Fast detection of communication patterns in distributed executions 

Thomas Kunz, Michiel F. H. Seuren


November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Publisher: IBM Press

Full text available:  pdf(4.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

20 Security issues with TCP/IP 

 Renqi Li, E. A. Unger

June 1995 **ACM SIGAPP Applied Computing Review**, Volume 3 Issue 1

Publisher: ACM Press

Full text available:  pdf(801.12 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

An introduction to network security , basic definitions and aa brief discussion of the architecture of TCP/IP as well as the Open System Interconnection(OSI) Reference Model open the paper. The relationship between TCP/IP and of some OSI layers is described. An indepth look is provided to the major protocols in TCP/IP suite and the security features and problems in this suite of protocols. The secutiy problems are discussed in the context ofthe protocol services.

Keywords: TCP/IP, Unix, network security, security

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